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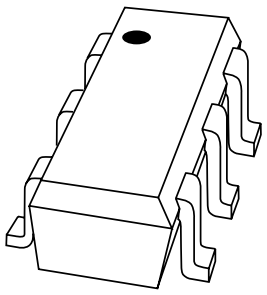
DATA SHEET



PUMF12

PNP general purpose transistor; NPN resistor-equipped transistor

Product specification

2002 Nov 07

Philips Semiconductors

PHILIPS

PNP general purpose transistor; NPN resistor-equipped transistor

PUMF12

FEATURES

- General purpose transistor and resistor equipped transistor in one package
- 100 mA collector current
- 50 V collector-emitter voltage
- 300 mW total power dissipation
- SOT363 package; replaces two SOT323 (SC-70) packaged devices on same PCB area
- Reduced pick and place costs.

APPLICATIONS

- Power management switch for portable equipment, e.g. cellular phone and CD player
- Switch for regulator.

DESCRIPTION

PNP general purpose transistor and an NPN resistor-equipped transistor in a SOT363 (SC-88) plastic package.

MARKING

TYPE NUMBER	MARKING CODE(1)
PUMF12	R2∗

Note

1. ∗ = p: Made in Hong Kong.
   ∗ = t: Made in Malaysia.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	MAX.	UNIT
TR1 (PNP)			
V_{CEO}	collector-emitter voltage	–50	V
I_C	collector current (DC)	–100	mA
I_{CM}	peak collector current	–200	mA
TR2 (NPN)			
V_{CEO}	collector-emitter voltage	50	V
I_O	output current (DC)	100	mA
R1	bias resistor	22	kΩ
R2	bias resistor	47	kΩ

PINNING

PIN	DESCRIPTION
1, 4	emitter TR1; TR2
2, 5	base TR1; TR2
6, 3	collector TR1; TR2

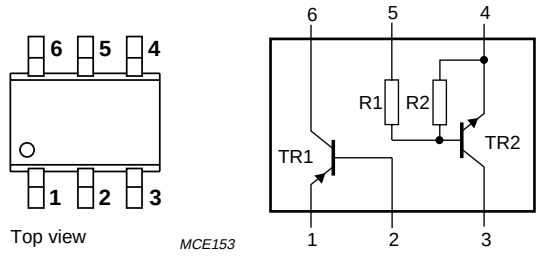


Fig.1 Simplified outline (SOT363) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 60134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
Per transistor					
P_{tot}	total power dissipation	$T_{amb} \leq 25$ °C; note 1	–	200	mW
T_{stg}	storage temperature range		–65	+150	°C
T_j	junction temperature		–	150	°C
T_{amb}	operating ambient temperature		–65	+150	°C
TR1 (PNP)					
V_{CBO}	collector-base voltage	open emitter	–	–50	V
V_{CEO}	collector-emitter voltage	open base	–	–40	V
V_{EBO}	emitter-base voltage	open collector	–	–5	V
I_C	collector current (DC)		–	–100	mA
I_{CM}	peak collector current		–	–200	mA
TR2 (NPN)					
V_{CBO}	collector-base voltage	open emitter	–	50	V
V_{CEO}	collector-emitter voltage	open base	–	50	V
V_{EBO}	emitter-base voltage	open collector	–	10	V
V_i	input voltage positive negative		 – –	 +40 –10	 V V
I_O	output current (DC)		–	100	mA
I_{CM}	peak collector current		–	100	mA
Per device					
P_{tot}	total power dissipation	$T_{amb} \leq 25$ °C; note 1	–	300	mW

Note

1. Device mounted on an FR4 printed-circuit board.

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	416	K/W

Note

1. Device mounted on an FR4 printed-circuit board.

CHARACTERISTICS

T_{amb} = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
TR1 (PNP)						
I_{CBO}	collector cut-off current	V_{CB} = –30 V; I_E = 0	–	–	–100	nA
		V_{CB} = –30 V; I_E = 0; T_j = 150 °C	–	–	–10	µA
I_{EBO}	emitter cut-off current	V_{EB} = –4 V; I_C = 0	–	–	–100	nA
V_{CEsat}	saturation voltage	I_C = –50 mA; I_B = –5 mA; note 1	–	–	–200	mV
h_{FE}	DC current gain	V_{CE} = –6 V; I_C = –1 mA	120	–	–	
C_c	collector capacitance	V_{CB} = –12 V; I_E = i_e = 0; f = 1 MHz	–	–	2.2	pF
f_T	transition frequency	V_{CE} = –12 V; I_C = –2 mA; f = 100 MHz	100	–	–	MHz
TR2 (NPN)						
I_{CBO}	collector-base cut-off current	V_{CB} = 50 V; I_E = 0	–	–	100	nA
I_{CEO}	collector-emitter cut-off current	V_{CE} = 30 V; I_B = 0	–	–	1	µA
		V_{CE} = 30 V; I_B = 0; T_j = 150 °C	–	–	50	µA
I_{EBO}	emitter-base cut-off current	V_{EB} = 5 V; I_C = 0	–	–	120	µA
h_{FE}	DC current gain	V_{CE} = 5 V; I_C = 5 mA	80	–	–	
V_{CEsat}	saturation voltage	I_C = 10 mA; I_B = 0.5 mA	–	–	150	mV
$V_{i(off)}$	input off voltage	V_{CE} = 5 V; I_C = 100 µA	–	0.9	0.5	V
$V_{i(on)}$	input on voltage	V_{CE} = 0.3 V; I_C = 2 mA	2	1.1	–	V
R1	input resistor		15.4	22	28.6	kΩ
$\frac{R2}{R1}$	resistor ratio		1.7	2.1	2.6	
C_c	collector capacitance	V_{CB} = 10 V; I_E = i_e = 0; f = 1 MHz	–	–	2.5	pF

Note

1. Device mounted on an FR4 printed-circuit board.

APPLICATION INFORMATION

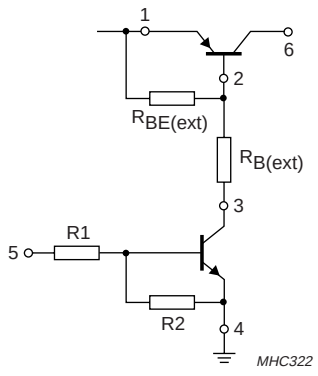
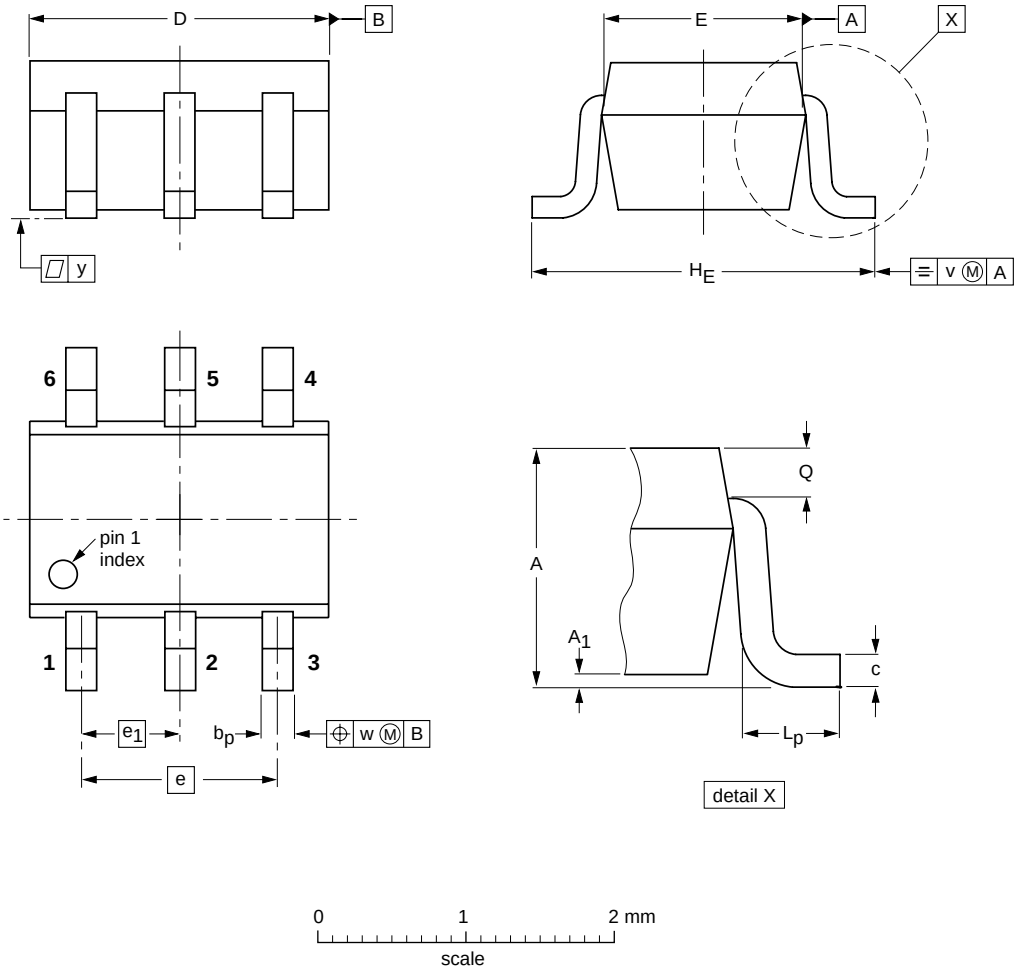


Fig.2 Typical power management circuit.

PACKAGE OUTLINE

Plastic surface mounted package; 6 leads **SOT363**



DIMENSIONS (mm are the original dimensions)

UNIT	A	A_1 max	b_p	c	D	E	e	e_1	H_E	L_p	Q	v	w	y
mm	1.1 0.8	0.1	0.30 0.20	0.25 0.10	2.2 1.8	1.35 1.15	1.3	0.65	2.2 2.0	0.45 0.15	0.25 0.15	0.2	0.2	0.1

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT363			SC-88			97-02-28

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